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(54) Title: ENERGY SAVING PASSIVE MATRIX DISPLAY DEVICE AND METHOD FOR DRIVING

	Phase and Subslot											
	0			1			2			3		
0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0	0	0	0	0
7	0	0	0	0	0	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	0	0	0
11	0	0	0	0	0	0	0	0	0	0	0	0
12	0	0	0	0	0	0	0	0	0	0	0	0
13	0	0	0	0	0	0	0	0	0	0	0	0
14	0	0	0	0	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0	0	0	0	0

(57) Abstract: The present invention concerns generally passive matrix displays, in particular a display device and a method for driving a display device. For reducing power consumption a display device is provided comprising a liquid crystal material between a first substrate provided with row electrodes (7) and a second substrate provided with column electrodes (6), in which overlapping parts of the row and column electrodes define pixels (8), driving means (5) for driving the column electrodes (6) in conformity with an image to be displayed, wherein column voltages  $G_j(t)$  are supplyable to the column electrodes (6), wherein the column voltages  $G_j(t)$  to be supplied are selectable from a predetermined number of column voltages levels; and driving means (4) for driving the row electrodes (7), wherein the row electrodes (7) supply groups of  $p$  rows ( $p \geq 1$ ) with mutually orthogonal selection signals ( $F_i$ ) for driving pixels (8), and the groups of  $p$  rows are driven for the duration of a row selection time  $p \times n_{frc}$  times during a superframe including  $n_{frc}$  frames for generating grey scales, wherein the row selection time is subdivided in  $n_{pwm}$  sub selection time slots, and the grey scales are coded in grey scale tables having  $n_{frc}$  phases with  $n_{pwm}$  sub selection time slots, wherein for the  $n_{frc}$  frames of a superframe the grey scales are generated by using phase

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mixing, defining which phase of grey scale coding is used for a certain frame, wherein a column voltage ( $G_j(t)$ ) is calculated depending on the grey scales to be displayed by the  $p$  concurrently driven pixels in a column and depending on 20 the used mutually orthogonal selection signals ( $F_i$ ) for the corresponding group of rows, wherein a change in the column voltage level is defining a transition, and wherein the column voltage ( $G_j(t)$ ) to be supplied to a column electrode (6) has always less transitions per row selection time than the number  $n_{pwm}$  of sub selection time slots of the row selection time.



SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ,  
GW, ML, MR, NE, SN, TD, TG).

*For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.*

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